

Fact Sheet

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United States Environmental Protection Agency  
Region 10  
Park Place Building, 13th Floor  
1200 Sixth Avenue, WD-134  
Seattle, Washington 98101  
(206) 442-1214

Date: July 30, 1987

Permit No.: ID-002540-2

PROPOSED REISSUANCE OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE POLLUTANTS PURSUANT TO THE PROVISIONS OF THE CLEAN WATER ACT

CYPRUS THOMPSON CREEK  
P.O. Box 62  
Clayton, Idaho 83227

has applied for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge pollutants pursuant to the provisions of the Clean Water Act. This fact sheet includes (a) the tentative determination of the Environmental Protection Agency (EPA) to reissue the permit, (b) information on public comment, public hearing and appeal procedures, (c) the description of the current discharge, (d) schedules of compliance and other conditions, and (e) a sketch or detailed description of the discharge location. We call your special attention to the technical material presented in the latter part of this document.

Persons wishing to comment on the tentative determinations contained in the proposed permit reissuance may do so by the expiration date of the Public Notice. All written comments should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the expiration date of the Public Notice, the Director, Water Division, will make final determinations with respect to the permit reissuance. The tentative determinations contained in the draft permit will become final conditions if no substantive comments are received during the Public Notice period.

The permit will become effective 30 days after the final determinations are made, unless a request for an evidentiary hearing is submitted within 30 days after receipt of the final determinations.

The proposed NPDES permit and other related documents are on file, may be inspected, and copies made at the above address any time between 8:30 a.m. and 4:00 p.m., Monday through Friday. Copies and other information may be requested by writing to EPA at the above address to the attention of the Water Permits Section, or by calling (206) 442-1214. This material is also available from the EPA Idaho Operations Office, 422 West Washington Street, Boise, Idaho 83702. A copying machine is available in the Seattle Office for public use at a charge of 20 cents per copy sheet. There is no charge if the total cost is less than 25 dollars.



I. Applicant

Cyprus Thompson Creek  
P.O. Box 62  
Clayton, Idaho 83227

NPDES Permit No.: ID-002540-2

II. Facility Location and Activity

The applicant (Cyprus) owns and operates an open pit molybdenum mine and concentration mill (SIC 1061) located 35 miles southwest of Challis, Idaho, in Custer County (Attachments #1 and #2). Process mill wastewater and mine drainage is contained in a tailings impoundment. Discharges consist of storm water runoff from waste rock dumps (outfalls #001 and #002) and storm water runoff from the mine access road (outfall #003).

III. Receiving Water

The mine site is drained by Thompson and Squaw Creeks, tributaries of the Salmon River (Attachment #2). Both drainages are classified by the State of Idaho for designated uses as agricultural water supply, secondary contact recreation and habitat for cold water biota and salmonid spawning. The Salmon River, at the points of confluence with Thompson and Squaw Creeks, has been classified as a Special Resource Water (Idaho Water Quality Standards and Wastewater Treatment Requirements, 1985, Section 1-2130).

IV. Background

The mine is located on property managed by the U.S. Forest Service (USFS), Challis National Forest, and the Bureau of Land Management. An Environmental Impact Statement (EIS) was published by the USFS on October 31, 1980. The selected alternative was that proposed by Cyprus and consisted of waste dumps located around the mine pit, and a "no discharge" tailings impoundment located in the upper Bruno Creek watershed.

An NPDES permit application was submitted by the company on April 14, 1980, for discharge of storm water runoff from waste rock dumps into Pat Hughes and Buckskin Creeks, both of which are tributaries of Thompson Creek. A permit was issued effective June 10, 1981, which expired on June 10, 1986. An application for permit reissuance was submitted on December 19, 1985. Due to uncertainties in the molybdenum market and a pending mine closure, the terms of the expired permit were continued in accordance with the Administrative Procedures Act [5 U.S.C. 558(c)]. On December 6, 1986, Cyprus announced a new mining plan based on an approximate 45% reduction in milling operations in hopes of assuring continued operation of the mine for an additional 3-5 years.

The Cyprus tailings impoundment is located at the headwaters of Bruno Creek, a tributary of Squaw Creek. Containment of mill tailings is accomplished by diversion of Bruno Creek headwaters and a seepage pump





back system. There is no discharge from the tailings impoundment to any surface waters. Seepage from the impoundment is collected in the seepage pond and pumped back to the impoundment. A water quality monitoring program outlined in the following sections has been implemented to quantify potential impacts from impoundment seepage.

V. Basis for Permit Limitations

Discharges of storm water runoff from waste rock disposal areas enter two small intermittent tributaries to Thompson Creek; Buckskin Creek and Pat Hughes Creek. Instream settling ponds have been constructed in both drainages, and are designed and maintained to provide for 24-hour detention of normal spring flows, in addition to a 10-year, 24-hour storm event. Previous permit conditions established suspended solids (TSS) and pH limitations, in addition to quarterly effluent monitoring requirements for cadmium, copper, zinc and arsenic. The permit also required turbidity monitoring at selected stations to verify compliance with State Water Quality Standards.

On December 3, 1982, EPA promulgated effluent guidelines for the Ore Mining and Dressing Point Source Category 40 CFR Part 440 (Subpart J). These guidelines establish specific technology based limitations for molybdenum mining and milling. Section 301 of the Clean Water Act requires that more stringent water quality based limitations be applied when the application of effluent guidelines interferes with the attainment or maintenance of existing water quality standards. In order to establish effluent limitations for the subject permit, EPA considered existing water quality data, Discharge Monitoring Reports (DMRs) submitted by the company, promulgated effluent guidelines, State Water Quality Standards and EPA Quality Criteria for Water (1986) for fresh water biota. Receiving water monitoring and DMR data are summarized on Attachment #3. Attachment #4 compares applicable Best Available Treatment (BAT) effluent guidelines limitations with water quality based criteria for toxic metals.

A. Outfalls #001 and #002 (Waste Rock Dumps)

1. Flow

Discharge volumes from outfalls #001 and #002 are not limited since flows from the in-line settling ponds vary with seasonal and climatic conditions and are not controlled by the permittee. Flows from outfall #001 typically occur during the spring and early summer during snowmelt, while discharges from outfall #002 usually occur year round.

Discharge and receiving water flows were used to establish water quality based effluent limitations. Flow data summarized on Attachment #3 show maximum flow periods to be the limiting basis for dilution calculations. During the low flow conditions, effluent discharges are either nonexistent or minimal. Application of the worst case flow conditions and the state's mixing zone policy of allowing only 25% of the volume of the receiving stream flow, results in a conservative 4.8 to 1 dilution (see Attachment #5). This dilution is used in calculating water quality based toxic effluent limitations.



## 2. Metals

Chronic and acute toxicity criteria (EPA, 1986) were used as the basis for calculating permit effluent limitations for arsenic, cadmium, lead, mercury, copper and zinc. EPA's "Permit Writer's Guide to Water Quality-Based Permitting for Toxic Pollutants" (February 1987), Table 3.1 was used to calculate the permit limits.

Attachment #7 contains the calculations for the final permit limits. The first two columns of numbers are the acute (criteria maximum concentration, CMC) and the chronic (criteria continuous concentration, CCC) criteria for the various metals from EPA's Water Quality Criteria (the "Gold Book").

Step 1 converts the CMC and CCC into acute and chronic waste load allocations (WLA),  $WLA_a$  and  $WLA_c$ , respectively. These allocations were derived as follows:

$$\begin{aligned} WLA_a &= (2) \times (CMC) \\ WLA_c &= (\text{Dilution Factor}) \times (CCC) = 4.8 \times (CCC) \end{aligned}$$

Step 2 converts the  $WLA_a$  and  $WLA_c$  to long term averages (LTA),  $LTA_a$  and  $LTA_c$ .

Step 3 selects the lower of  $LTA_a$  and  $LTA_c$ .

Step 4 derives the permit limit from the limiting LTA.

For this permit, only a daily maximum limit was calculated since the permit requires only monthly monitoring. The derived limits of Step 4 are then compared to the effluent guidelines, see Attachment #4. The more stringent of the two become the permit effluent limits.

The derived limit for mercury is 0.000057 mg/l or 0.057 ug/l. The lower detection level for mercury is 0.2 ug/l. Since the derived limit is less than the detection level, the permit limit for mercury is "non-detectable."

## 3. TSS:

Previous permit limitations of 20 mg/l daily average and 30 mg/l daily maximum will be retained in the reissued permit. These limitations are based on effluent guidelines and considered sufficient to assure compliance with water quality standards, based on past monitoring data.

## 4. pH:

pH is limited in the range 6.0 - 9.0, and reflects effluent guidelines. Past monitoring data has shown this limitation adequate to protect water quality standards.

## B. Outfall #003 (Mine Access Road Stormwater Diversion)

The permittee will be required to monitor turbidity above and below the Bruno Creek access road stormwater settling ponds to assure compliance with State Water Quality Standards. This monitoring shall be performed





in accordance with requirements of the water quality monitoring program established by the USFS, IDHW-DOE and Cyprus (Attachment #8).

VI. Basis for Monitoring Requirements

The permittee will be required to comply with the following monitoring requirements for outfalls #001 and #002:

<u>Parameter</u>	<u>Frequency</u>
Flow	Daily
pH	Weekly
TSS	Weekly
Arsenic	Monthly
Cadmium	Monthly
Lead	Monthly
Mercury	Monthly
Copper	Monthly
Zinc	Monthly

The above monitoring requirements are considered adequate to characterize the permittee's discharge. Effluent quality from the tailings pond should not vary significantly from week to week. Therefore, metals monitoring will be monthly. An indication of variability in the effluent quality can be noted in a significant change in pH, TSS, and flow. Consequently, these parameters will be monitored more frequently.

Cyprus Thompson Creek Water Monitoring Program

In addition to the above referenced monitoring, the permittee shall continue to provide for water quality monitoring in accordance with the program agreed upon by the USFS, IDHW-DOE and the permittee. The major areas covered by the water quality plan are as follows:

1. Surface water quality of Thompson and Squaw Creek drainages.
2. Quantity and quality of effluent released from settling ponds on Pat Hughes and Buckskin Creeks.
3. Surface and groundwater quality in the tailings impoundment drainage basin.
4. Quality of groundwater developed as potable sources for workers at the mine site.
5. Fish and invertebrate populations of streams draining the active mine and mill operation areas.

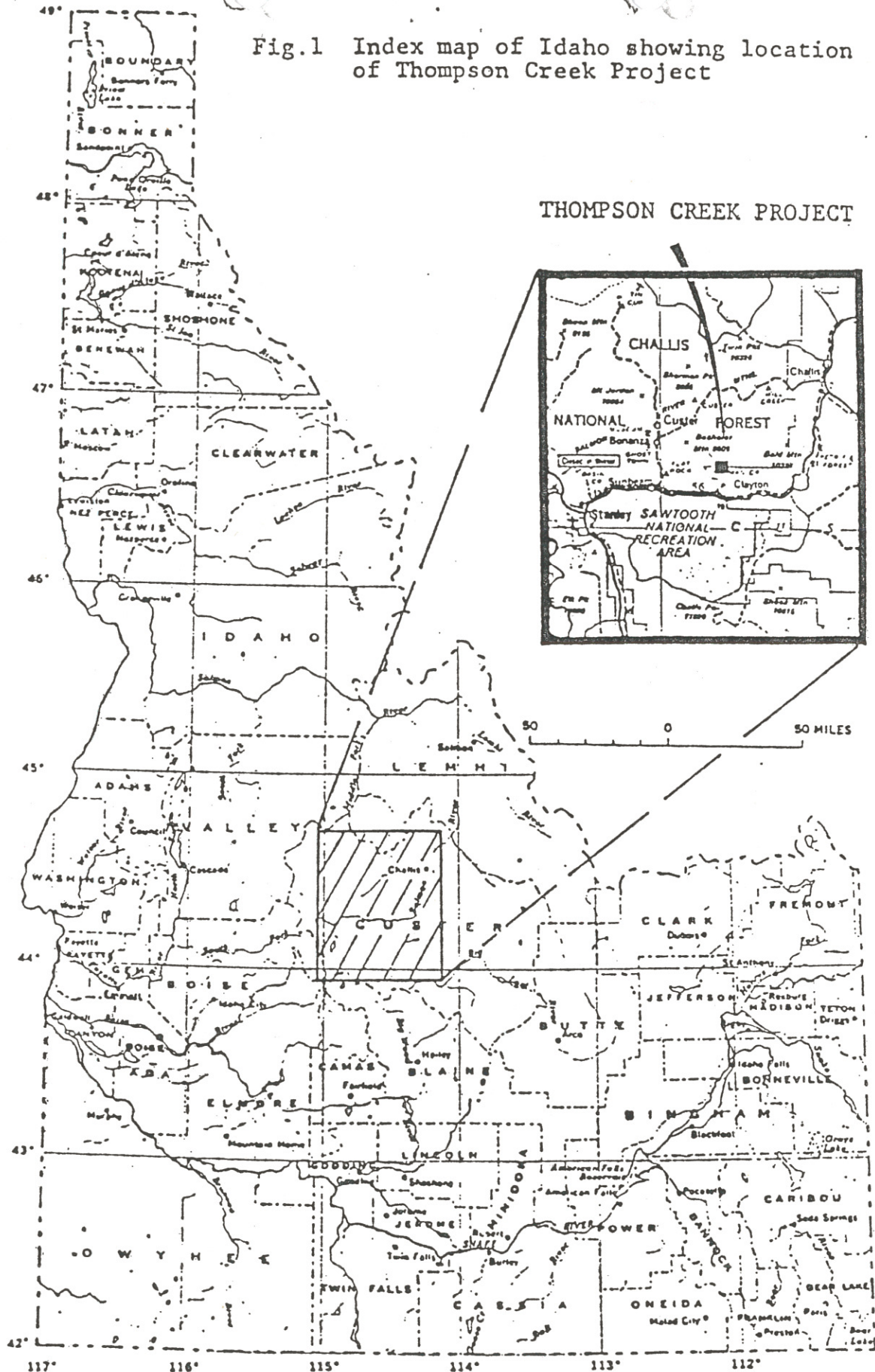
Attachment #8 summarizes this monitoring program.

VII. Other Conditions

The permit is proposed to be effective for a period of five (5) years, and subject to modification should monitoring results indicate adverse water quality impacts.



Fig.1 Index map of Idaho showing location of Thompson Creek Project







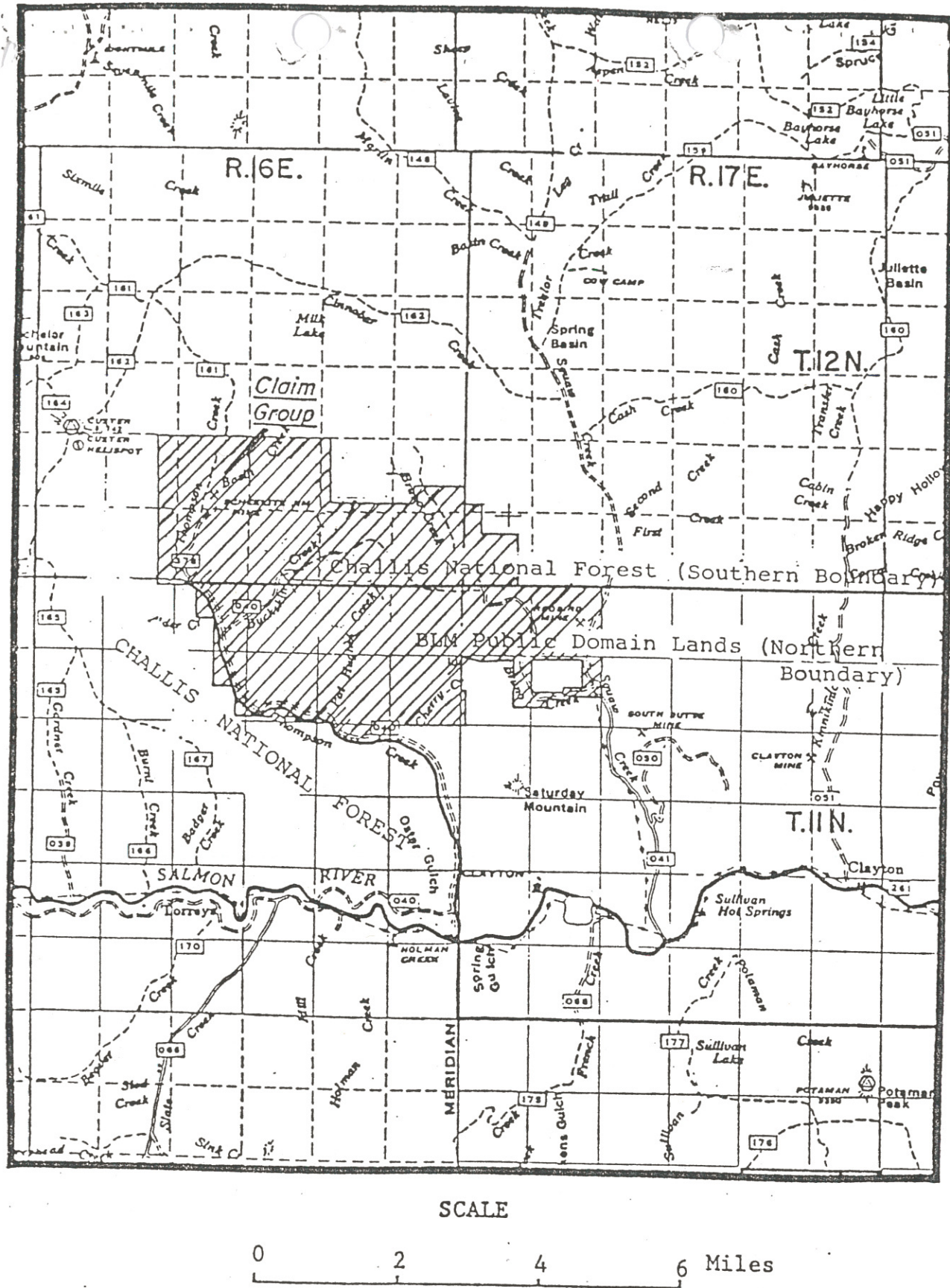


Fig.2 Location of Thompson Creek Project, Custer Co., Idaho



## CYPRUS THOMPSON CREEK

## DATA SUMMARY (1981 - 1986)

	Thompson Creek (Upstream)			Buckskin Creek (001)			Pat Hughes Creek (002)			Thompson Creek (Downstream)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Flow (cfs)				0	9.5	0.6	0	8.6	0.5	4.8	132	24.3
pH	6.6	8.6	7.6	7.6	7.75	7.9	7.7	7.95	8.1	7.0	8.9	7.6
TSS (mg/l)	0	52	6	1.0	57.0	6.32	1.0	95.0	8.1	0	80	8.4
AS (mg/l)	<0.005	0.02	1 + sample	<0.005	0.1		<0.005	0.31		All <0.005		
Cd (mg/l)	All <0.005			0.001	0.005		0.001	0.005		All <0.005		
Pb (mg/l)	All <0.05			No data			No data			All <0.05		
Hg (mg/l)	<0.0005	0.0015	5 + samples	No data			No data			<0.0005	0.0016	3 + samples
Cu (mg/l)	<0.01	0.02	5 + samples	<0.01	0.01		<0.01	0.01		All <0.01		
Zn (mg/l)	0.003	0.044	0.018	0.005	0.54	0.025	<0.01	0.083	0.037	0.001	0.028	0.016





## ATTACHMENT #4

## CYPRUS THOMPSON CREEK

TOXIC EFFLUENT LIMITATIONS SUMMARY  
(All numbers are in mg/l)

PARAMETER	<u>Effluent Guidelines<sup>1/</sup></u>		<u>Water Quality Criteria</u> (EPA "Gold Book" Criteria)		<u>Derived Limits<sup>2/</sup></u> Daily Max.	<u>Permit Limits<sup>3/</sup></u> Daily Maximum
	<u>Daily Avg.</u>	<u>Daily Max.</u>	<u>acute (CMC)</u>	<u>chronic (CCC)</u>		
Arsenic	N/A	N/A	0.19	0.36	0.49	0.49
Cadmium	0.05	0.10	0.011	0.039	0.0053	0.0053
Lead	0.3	0.6	0.032	0.082	0.015	0.015
Mercury	0.001	0.002	0.000012	0.0024	0.000057	0.000057 < detectable
Copper	0.15	0.30	0.012	0.018	0.0245	0.0245
Zinc	0.75	1.5	0.047	0.32	0.163	0.163

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1. 40 CFR 440 Subpart J

2. From the last column of Attachment #7

3. Permit limits are the more stringent of the effluent guidelines (columns 1 and 2) and the derived limit (column 5)



ATTACHMENT #5

Calculation of dilution factor using flow data from Attachment #3 and the states mixing zone standard (1-2400.03(e)(4)) to include only 25% of the volume of the receiving stream flow, the dilution factor is:

$$\frac{132 (25\%) + 8.6}{8.6} = 4.8$$





ATTACHMENT #6

Step 2, to calculate  $LTA_C$

Assume  $n = 1$  (the number of samples collected per month)  
 $CV = 0.6$  (Coefficient of variation is unknown. The permit writer's guide recommends  $CV = 0.6$  if the CV is unknown.)  
 $Z = 1.645$  (for the 95th percentile)

$$LTA_C = e^{(u + .5 \sigma^2)}$$

Where,  $\sigma^2 = \ln(CV^2 + 1)$

$$= \ln(0.6^2 + 1) = 0.30748$$

and  $u = \ln(WLA_C) - Z \sqrt{\ln[1 + ((e^{\sigma^2} - 1)/n)]}$

$$= \ln(WLA_C) - 1.645 \sqrt{\ln[1 + ((e^{\sigma^2} - 1)/1)]}$$

$$= \ln(WLA_C) - 1.645 \sqrt{\ln(e^{\sigma^2})}$$

$$= \ln(WLA_C) - 1.645 (\sigma)$$

$$u = \ln(WLA_C) - 0.912$$

Then,  $LTA_C = e^{(\ln WLA_C - 0.912 + .5 (.30748))}$

$$LTA_C = 2.71828^{(\ln WLA_C - 0.75826)}$$



## ATTACHMENT #7

Derivation of Permit Effluent Limitations<sup>1/</sup>  
(All numbers are in mg/l)

Gold Book <sup>2/</sup> CMC / CCC Acute / Chronic		WLAa / WLAc (Step 1)		LTAA / LTAc (Step 2)		(Step 3)	Derived Limitation <sup>4/</sup> Daily Maximum, mg/l (Step 4)
As	.36 .19	0.72	0.912 3.10	.23	.427	.23	.49
Cd	.0039 .0011	0.0078	.0053 1.798	.002496	.00248	.00248	.0053
Pb	.082 .0032	0.164	.015 0.5232	.052	.00703	.00703	.0150
Hg	.0024 .000012	0.0048	.000057	.001536	.0000267	.0000267	.000057
Cu	.018 .012	0.036	.0576	.01152	.027	.01152	.0245
Zn	.120 .110	0.240	.528	.0768	.247	.0768	0.163
			1.7985	.007	.278	.07140	.1645

1. This chart of numbers contain the calculations which are used to derive permit limits that will protect against both acute and chronic instream effects. The process for this derivation are found in EPA's "Permit Writer's Guide to Water Quality-Based Permitting For Toxic Pollutants," (February 1987), Table 3.1.

2. Water Quality Criteria, The "Gold Book" Criteria

3. CMC = Criteria Maximum Concentration  
CCC = Criteria Continuous Concentration

4. (Step 3) x 2.13 = Step 4 = Maximum Daily Limit

2.13 is from the table in Step 4 from Table 3.1 for CV = 0.6

